



Original research article

Class capacities and climate politics: Coal and conflict in the United States energy policy-planning network



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ARTICLE INFO

Keywords:

Climate change politics
Coal
Social network analysis
Climate capitalism

ABSTRACT

This article employs a power structure research approach and exploratory network analysis to describe the differing stances on climate action that existed within the United States elite energy policy-planning network during efforts to generate climate legislation in 2009. These divisions are explored in relation to the structural location of the coal industry, other energy sectors, and environmental organizations within the network of director interlocks. My key findings are that coal interests are well integrated into the policy-planning network with major coal producers and reserve holders most connected to ultra-conservative business policy groups and industry associations committed to climate denial while a “coal coalition” of coal-related interests provide linkages to influential moderate conservative groups and industry associations taking a conciliatory stance on climate action. The largest oil and gas firms vary more than the coal industry in their affiliations. In general, policy groups that support climate action are on average significantly less central within the overall EPPN compared to those that do not. I discuss the implications of these findings for understanding the boundaries of United States and global climate policy formation.

1. Introduction

Although the natural scientific community has become increasingly certain and vocal that safely avoiding catastrophic threats from climate change demands major transitions in our energy systems, interdisciplinary groups like the IPCC, the United States Academy of sciences, and energy journals have been slow and partial in incorporating important social science insights into understandings of energy systems [1,2]. The most commonly adopted perspectives from social science employ a methodological individualism from economics or psychology with functionalist assumptions about how social institutions make rational choices that are consensual and adaptive. The American Sociological Association Task Force on Climate Change has warned this results in the dominance of a “post-political” frame that treats the problem of energy transition primarily in technocratic terms and thereby “obscures the institutional and structural roots of climate change, limiting political action in favor of consensual approaches such as individual behavioral change and market-oriented ones like emissions trading” [2].

The emergence of a coalition of business and environmental groups in the United States in 2009 supporting legislation to cap and trade carbon emissions seems like functionalist problem solving within that post-political frame, bringing the United States closer into line with the

pragmatic energy transformation agenda in other developed nations. However, as Stirling warns “the realised forms of ‘transformation’ may be more discursive and superficial than material and substantive. The more radical and challenging the attempted transformation, the greater this propensity to subversion” [3] p.84]. Because of the United States’ status as the top historical emitter of greenhouse gasses, one of the largest still today, and its continued economic and political hegemony in the world system, its failure to adopt climate policies is a major stumbling block for global efforts at an energy transition away from fossil fuels. To understand the lines of cohesion and division among powerful institutions in United States society we must question dominant assumptions about how powerful institutions shape discourse around energy policy in ways that protect incumbent interests [3]. This article analyzes the Energy Policy-Planning Network of industry associations, think tanks, and policy discussion groups most influential in generating and debating policy proposals considered by United States policy makers [4]. It is the Policy-Planning Network that gives the capitalist class the *organizational capacity* to develop class consciousness and engage in class mobilization and exclude counter-hegemonic voices from the policy formation process. But, different class fractions can have diverging interests, opinions, and organizational capacity to exert influence within the network. I describe key organizational capacities of the “coal coalition” within the EPPN and map for the first time how

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Received 21 March 2018; Received in revised form 21 August 2018; Accepted 7 September 2018

Available online 12 October 2018

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the basic climate discourse stance of policy-planning organizations corresponds with their director interlocks with the largest United States coal interests, oil and gas firms, and the key environmental and business organizations pushing climate action in 2009.

There is an extensive body of literature dedicated to the analysis of the contradictions inherent in reducing fossil fuel use on a scale necessary to avoid catastrophic climate change within a capitalist economy, making it a radical transformation indeed [5–9]. A major assertion is that the speed of emissions reductions necessary to stabilize the climate is incompatible with the rates of growth and accumulation required for a stable capitalism. But even assuming such an incompatibility exists, the question remains as to whether and how this structural constraint is perceived by elite business and policy makers. The structure of the capitalist response to climate change reflects both the real divisions between capitalists over the extent of threats and opportunities they face from climate regulation and unified opposition to policies where there is agreement they would curtail economic growth in general [5,6,10–12]. Given climate change's projected catastrophically destructive effects, many capitalist state actors are under increasing pressure to offer some kind of action to retain legitimacy and avoid threats to their own institutional interests from its impacts. For example, Carroll has recently described how the interlocking boards of directors between major fossil fuel corporations in Canada and the policy and opinion shaping organization of civil society create the “architecture for ‘soft denial’” that recognizes the carbon threat but offers only superficial responses [13,14]. On the global stage, Sapinski has described efforts by a transnational network of corporate-funded think tanks and policy groups to construct a project of “climate capitalism,” rallying a coalition to protect the currently hegemonic neoliberal order by promising to reconcile growth and emissions reductions through market mechanisms [15,16]. But he warns that even “the rise to hegemonic status of climate capitalism would not be effective to avoid the most catastrophic consequences of climate change” and it is “a form of climate change denial in its own right” because of its imperative to delay cuts beyond what the estimated carbon budget allows and make them contingent on technological breakthroughs [16,17: p.14].

The fossil fuel industry generally, and coal in particular, have a historically prominent position within the United States power structure relative to many other nations [18,19] and have proven unwilling and unable, given the state of available technological fixes, to agree to ecologically consequential emissions reductions. There are many factors that help explain this beyond the structural relationship of cheap energy to growth, including the role of energy and fossil fuels in United States geopolitical dominance [20,21], and contingent historical factors like the abundance and distribution of fuel sources across United States electoral districts [22]. The United States climate change counter-movement has been uniquely effective in promoting climate change denialism, in part due to the alliance between these significant fossil fuel fractions of the capitalist class and the nation's extraordinarily prominent ultra-conservative policy groups [23–25].¹ This is a different response to the legitimization crisis. However, as Bonds has argued: “A full accounting of [US] policy development must also acknowledge that many members of the corporate community have long recognized climate change as reality, and the think tanks they fund and direct have advocated for measures to begin reducing carbon emissions...[but] hardly envisioning the creation of a new economic infrastructure that is no longer dependent upon fossil fuels.” [12: p.314]. There is a tension between the dividing fractional interests of capital in different energy

sectors based on the threats or opportunities presented by climate change and the potentially unifying role of policy planning organizations in the class formation and mobilization processes. A “power-structure research approach... recognizes that while the corporate community is unified on important matters related to the economy and the [United States] class structure, it is also split along certain issues such as climate change” [12: p.306–7]. The coal industry, as the most carbon intensive source of energy, faces the greatest potential threat from climate regulation. The United States has the largest coal reserves in the world and the industry has had an importance in the country's political economy that is relatively unique. The peak of efforts at formulation of climate policy there in 2009 is a valuable case study of the structure of the EPNN and the place of coal interests, other fossil fuels, and the architecture of efforts at a “climate capitalism” within a nation where hard denial has been prominent.

After a review of the power structure research in relation to environmental policy, I then describe the “coal coalition” of linked economic interests across different sectors identified in the literature as supporting the coal industry during policy formation in the past and changes in coalition's key institutions circa 2009. Next, I contextualize corporate dominated climate politics in 2009 (what Sapinski calls “climate capitalism”) as a political capitalism strategy pursued by particular class fractions within the EPNN. I employ exploratory network analysis to describe the place of coal interests, the broader fossil fuel industry, and the United States Climate Action Partnership coalition within the energy policy-planning network and the climate policy stances taken by organizations during the push for cap and trade legislation. In describing this network I am able to offer exploratory analysis of the relationship between industry ties and climate position and show the integration of various fossil fuel associations relative to those of renewable energy associations and environmental groups. Finally, to contextualize claims of business support for climate action, I am able to measure whether organizations that took a stance supporting climate action were more central within the overall network.

2. Environmental politics in the power structure literature

My theoretical approach in this paper draws primarily from Domhoff's conceptualization of the policy planning network and the role of the power elite within it, but I view this framework and its empirical literature within a larger Marxist or neoMarxist political economy of the state that Domhoff does not share. However, at the level of abstraction for this analysis the larger theoretical disagreements between the perspectives do not present a barrier.

“For all intents and purposes, Domhoff shows that Marx's—or better, Gramsci's or Poulantzas's—conception of a dominant class, exhibiting hegemony over economic and social institutions, really exists in the United States, and that this class is a corporate bourgeoisie, cohesive and with clear definitions of who is and is not a member, but at the same time in conflict and disagreement about how best to run the society to protect its particular interests. ... [he] describes a state that represents the interests of the corporate class while at the same time opposes the interests of individual capitals or fractions of the business elite” [26 p.213–14]

Domhoff's concept of the policy-planning network in the United States can be theorized as an example of an ideological state apparatus in the framework of Poulantzas [27,28] where rival power blocs compete for hegemony and intellectual production takes place to ensure capitalist class hegemony in the wider society. The *policy-planning process* of general and long-term class interests is distinguished from the *special-interest process* concerned with narrower and short-term interests of particular corporations, families, or sectors [29]. In environmental politics the former sets the boundaries of what is acceptable in line with general class interests while the latter can involve considerable conflict between particular class fractions or even defeats of particular fractions

¹ While United States politics have long been to the right compared with other developed nations, this counter-movement offensive and the increased partisanship around the science increased precisely as the implications of the science for the incompatibility of capitalist growth and necessary emissions reductions became clearer [11].

by environmentalists or labor.

Reviewing studies of corporate power and environmental policy in the US, Gonzalez [30] contends, in line with Domhoff's [31,32] general argument, that analyses of environmental legislation from the pluralist and state autonomy perspectives falter by missing the capitalist class dominance through the policy planning network. Rather than autonomously drawing on diverse independent interest groups who compete for influence, state managers craft policy from a pool of ideas dominated by capitalist interests. Furthermore, even in the case of seemingly major defeats for corporate interests, final policy decisions disproportionately reflect the contributions of the most corporate dominated policy groups [30,33].² The policy-planning network, they argue, is an example of class dominance because of the way it organizes and projects power for the corporate community.

Social scientists have long used the existence of networks of individuals linking capitalist firms and institutions to study the actual exercise of class power [34–37]. The “corporate community” is made up of the boards of institutions controlled by the capitalist class either through ownership, as in the case of corporations, or through non-profits controlled by financial dependence and upper class presence on their boards. One way these groups are linked into a “community” is through interlocking directorates. Interlocks are formed when members of one board also serve on others, thus directors link institutions and institutions link directors. Formal network analysis has been used since the 1970s to analyze the capacity for capitalists to organize and act as a class and, by the 1980s, to investigate the political behavior associated with these networks [38]. For example, interlocks have been shown to predict levels of corporate political donations, political cohesion at the individual level in studies of campaign contributions, the similarity of political ideology at the organization level, and the similarity of congressional testimony as well [38–44]. Members of the corporate community are frequently appointed to government positions and their presence on official advisory boards further undermines the autonomy of the State [29: 168–72]. Steven Griles, for example, moved back and forth between the Department of the Interior and work as a coal lobbyist and executive playing a key role in undermining surface mine regulation in both the Reagan and George W. Bush Administrations, blocking the autonomous efforts of government scientists [45,46].

The capitalist class provides funding and leadership for the major foundations, think tanks, and policy-discussion organizations of the policy planning network [29]. It is *the key structure* through which the capitalist class is able to formulate and pursue its political agenda. The interlocks between firms have been shown to contribute to political cohesion and diffusion of business strategies, but the interlocks between policy planning groups are more consistently stable and meaningful [40–42,47]. Many environmental groups involved in policy formation not only receive significant funding from the foundations of the network but are also connected to the corporate community via shared directors on their governing boards. For example, Brulle [48] has shown that although the Ford Foundation was a critical source of impetus and startup funds for many of the largest environmental organizations today (such as Resources for the Future and the Natural Resources Defense Council), overall, foundation funding priorities marginalize environmental organizations associated with the environmental justice movement in favor of organizations whose goals do not directly threaten capitalist priorities. Corporations for their part view these interlocks with environmental groups pragmatically: “ties are viewed as instruments to achieve reputational effects or legitimacy that would otherwise be hard to obtain... to guard against reputational risks by either having an NGO ‘on side’ or by gaining information that permits action before a threat materializes in earnest” [10: p.60]. These groups have also helped train future appointees to government office

(such as H.W Bush EPA head William Reilly who was previously a director at both Environmental Defense Fund and the Conservation fund [30: p.17]) usually providing a moderate conservative approach favored by the corporate community [29: p.85].

What Domhoff calls the “moderate conservative” openness to government intervention behind early support environmental organizations has been labeled by some as a distinct “corporate liberal” perspective developed by certain class fractions in the interest of maintaining legitimacy [49]. Kolko's conception of political capitalism provides a complementary explanation as to why the capitalist class would support the formation of new social (e.g. Keep America Beautiful) and regulatory bodies, not only as a *concession* for legitimacy but also to improve conditions for capital investment. “Political capitalism is the utilization of political outlets to attain conditions of stability, predictability and security—to attain rationalization—in the economy” [50: p.3]. The functioning of political capitalism does not require a fully developed class consciousness and unity on the part of the capitalist class. Indeed, in the past it has involved larger oligopolistic firms supporting regulatory policies that would facilitate rationalization and gains to market share for themselves at the expense of smaller firms or other sectors (e.g. as in the case of origins of the Food and Drug Administration [50]). This is consistent with Poulantzas's [27] conception of hegemonic power exercised by the power bloc of dominant class fractions. Climate change presents a threat to both the legitimacy of the current capitalist order and the predictability of conditions of investment and growth, but capitalist elites in the United States have significant ideological differences in their openness to political capitalism rationalization (in addition to varying sectoral interests).

The dominant organizations in the policy planning network are divided politically into moderate-conservative and ultra-conservative factions that reflect some of these divisions with the latter being more ideologically opposed to regulation and government intervention [51]. Jenkins and Eckert analyze how the moderate and ultra-conservative organizations of the policy planning network generated the policy ideas behind the general rightward turn in United States politics occurring since the late 1970s. They find support for what they term “corporate elite theory” emphasizing the dominance of the owners and directors of the largest firms as well as “class fraction theories” that emphasize divisions between capitalists based on industry and sector with rival power blocs dominated by the hegemony of the most advanced sectors [49]. The emerging picture is one where social, industrial, regional backgrounds of policy group directors make a difference in their organization's policy stances, but the “inner circle” of highly connected directors of large firms dominate the major business policy organizations which in turn serve a unifying function of bringing together business leaders across industries and regions. Corresponding with the rightward shift in capitalist politics, cluster analysis by Burriss [47] found the “liberal”/moderate policy-planning groups like the Committee for Economic Development lost network centrality and were replaced by ultra-conservatives like the American Enterprise Institute to form a new core with the most central moderate groups.³ This *finding highlights the value of director interlocks between policy groups as one indicator of the degree of policy alignment of different fractions*. But it remains to be seen how these opposing processes are at work around climate policy. Energy sectors' different prospects in terms of carbon intensity, need for regulator certainty, and general ideological alignment would be likely axes of fractional division over climate change.

Despite consistent public support for environmental protection, *even at the cost of growth* [52], the corporate community became more aggressive in opposing any limits to growth since the 1980s, including environmental regulation. Analyzing electrical utility regulation

² However, it would also be a mistake to fall into the functionalist assumption that every environmental reform is simply a forward-looking capitalist class.

³ These “liberal” groups also moved to the right during this period and I follow Domhoff and Burriss in labeling the two main factions today as moderate and ultra-conservative.

Prechel [53: p.372] concludes:

The reconfiguration of corporate–state relations between 1978 and 2008 was the outcome of political capitalism, which placed a high priority on economic growth and a low priority on environmental sustainability and public health...energy companies engaged in political capitalism to circumvent the Clean Air Act and other environmental legislation.

Underlying this trend is the increased organization and influence of the energy industry within the larger United States power structure (which adds to their already formidable structural power within the economy). Strangfeld [18] found that more comprehensive director interlocks between the top ten energy firms and the policy planning network (particularly members of its inner circle) were associated with more cohesion in formulating and pursuing a corporate policy agenda in the Energy Policy Act of 1992 as compared with the Act of 1979. General business groups were the key to increased ties between different energy industry associations. Consistent with Burris [51] and Domhoff [54], the most central moderate policy groups such as the Business Roundtable, Business Council, and Committee on Economic Development played a key role in linking large multinational firms to smaller or more domestically oriented firms (such as utilities), with closer ties to the ultra-conservative wing of the PPN [18]. While both energy bills reflected the positions of the core moderate policy groups like the Business Roundtable, by 1992, along with the general shift to the right in corporate politics, the policy positions of the most central moderate conservative policy groups became more reflective of the dominant sectors of the energy industry, for example, increasing support for nuclear power while reducing it for renewables like solar [18].⁴

Crawford [4] analyzes the sector-specific United States energy policy planning network (EPPN) consisting of the top 20 policy planning network organizations identified in the literature as well as major industry lobbying groups and some environmental groups with a significant energy policy presence. Concurring with Strangfeld [18], the American Petroleum Institute and National Petroleum Council were among the most central policy groups; however, in 2002 the Chamber of Commerce appears to have increased its proximity to energy firms [4].⁵ The extent of the energy sector's ties to the PPN and their degree of alignment with moderate and ultra-conservative policy groups illuminates the capacities for coordination or conflict around climate policy.

Coal, despite providing over half of the electrical power between 1961 and 2008, had historically been a junior partner to major multinational players such as oil and gas within the EPPN [4,19,55]. Yet coal is uniquely vulnerable to climate regulations. Fisher [22] has shown how the United States coal industry's unique material features of labor-intensive extraction, massive size and locations of reserves, together with its central place in electrical power infrastructure and role as an export commodity contributed to congressional opposition to climate action in the late 1990s and early 2000s, in recognition of that unique vulnerability. However, the question remains as to how the PPN shapes discourse to legitimize that inaction and whether different sectors form a unified front or seek advantage. It is necessary to briefly examine how coal's influence and interests in the EPPN are related to the changing structures of coal ownership, production and consumption and how these stand in 2009.

⁴ The moderate Committee on Economic Development had in 1974 shared the oil and gas industry's general desire for deregulation but broke with them and utilities in being supportive of renewables like geothermal and solar but apprehensive toward nuclear. By the early 1990s the moderate policy groups and fossil and utility groups' policy positions were aligned consistent with industry preferences [18].

⁵ There was unfortunately an error in this analysis that excluded the Business Roundtable from the final results.

3. The coal coalition's place in the policy formation network

"[B]y the mid-1960s a cohesive political coalition of coal-related industries was evolving from post-World War II financial and technological interdependencies. Interlocked trade associations and industry advisory councils provided the institutional order for the coalition's political activity. Environmentalism provided a common cause" [55: p.57]. Each coalition sector had reasons to oppose environmental (or labor) regulation that would limit industrial growth and contributed resources to politically active association groups as well as often engaging in political action themselves.

Large-scale incorporation into the oil industry brought big oil's formidable financial and political influence to bear on behalf of the coal industry. When purchased by oil firms and other dominant capitals like the steel industry, coal companies' director interlocks increased dramatically. Interlocks with large commercial banks, previously rare, provided new communication lines for coordinating policy. Beyond increased interlocks, major banks invested in long-term projects for increased coal use that tied their own business interest to avoiding regulatory burdens on coal [55]. In the 1960s the coal industry out-matched environmentalists seeking to influence regulators in their control and use of data necessary to make or contest arguments for policy. However, as the environmental movement continued to grow, industry found itself under increasing pressure to respond.

At the national level, the National Coal Policy Conference (NCPC) was initially dedicated to pushing federal policy *away from oil, gas, and nuclear and toward coal*. When air pollution became a policy issue in the late 1960s, NCPC was influential in weakening clean air legislation, but by 1971 it dissolved due to conflict with labor, the new influence of former rivals in oil now among its members, and the increased power and sophistication of the National Coal Association (NCA), which became a new center of power for the industry. The American Mining Congress (AMC) was the most important source of *inter-industry* collaboration. This was an important link for coal capitals not already tied through big oil and gas owners to the larger mining community. Influence was wielded most directly on the *government advisory boards*. Nixon's National Industrial Pollution Control Council (NIPCC) met in secret and were able to use the Department of Commerce as a public relations tool. The NIPCC collaborated with the AMC, Edison Electric Institute (EEI), and other members of the coalition to produce studies that dramatized the economic costs of environmental clean air protections and, critically, pushed to have cost-benefit considerations added to regulation processes. Because of horizontal integration by oil companies, the National Petroleum Council had by the 1970s absorbed not only substantial coal interests but even nuclear interests and became established as the most influential governmental advisory group on *energy issues generally* [18].

"By the mid-1970's, an identifiable coalition of coal interests had emerged, its foundation resting on seven industrial sectors: coal production, oil and gas, metals, electric utilities, railroads, mining equipment manufacturers, and commercial banks" [55: p.21]. The easing of the energy crisis and falling prices for energy commodities in the 1980s have shaken up the oil-coal ownership structure that helped form the Coal Coalition identified by Vietor. The percentage of coal production owned by oil and gas companies increased from thirty-two in 1976 to forty-four in 1986 but had declined to less than thirty by the early 1990s [56]. The divestment trend appears to have continued into 2009 with just Chevron and CONSOL left in the top 29 producers in the US, together accounting for less than a tenth of their production [57: p.25].

Since Vietor's study there has been both continuity and divergence in the trends he recorded. Reflecting continuing concentration, the National Coal Association and the American Mining Congress merged in 1995 to form the National Mining Association (NMA). They were a major contributor to the Air Quality Standards Coalition formed in the late 1990s and chaired by the National Association of Manufacturers to oppose new EPA air regulations. Another important new policy group,

the Center for Energy and Economic Development (CEED), emerged in 2000. The CEED has been a central actor in shaping the debate on climate change regulation and is the parent organization of Americans for Balanced Energy Choices, later renamed the American Coalition for Clean Coal Electricity (ACCCE), whose members include many of the largest mining, rail, and utilities companies in the United States.

Coal coalition involvement in government advisory boards continued during the George W. Bush administration. Vice President Dick Cheney's National Energy Policy Development Group was a broader and even more secretive incarnation of Nixon's NIPCC. Even identities of who met with this group are a closely guarded secret, but leaked documents show how "Jack N. Gerard, then with the National Mining Association, ... [met with the group and]... urged the administration to give the Energy Department responsibility for promoting technology for easing global warming and to keep the issue away from the Environmental Protection Agency" [58]. The mega-utility Southern Company in particular, successfully lobbied to gut enforcement of the Clinton era New Source Review (NSR) rule requiring utilities who upgrade generation capacity to install the best available pollution controls. Bush also placed the CEO of Peabody Energy, Irl Engelhardt, on his EPA transition team along with Peabody VP John Wooten on the Department of Energy team and other corporate coal leaders in that Department and the Department of Interior. His chief of staff for Environmental Quality was the former head of the American Petroleum Institute's anti-climate science team [59: p.167–8].

4. The climate threat and USCAP's political capitalism response

Coal, nuclear, and gas were in competition over energy priorities in the late 1970s but had developed more indirect network ties and co-operative lobbying by 1992 [18]. The nuclear and natural gas industries are the most obviously positioned large energy interests, in addition to the smaller renewables sector, to leverage constrained coal use from climate policy for their benefit. In the absence of a common ownership structure linking coal, oil, and gas, coordination in the face of competing interests would depend more than ever on the policy planning network organizations' potential to act as mediators across energy sectors.

Europe had implemented climate regulations in 2005 reflecting the "climate capitalism" project discussed above [16]. It also appeared increasingly likely that fossil fuel interests would face a United States government controlled by the less loyal Democratic Party and some kind of climate related regulation seemed a strong probability. In early 2007, four environmental groups, including three of the largest mainstream groups, and ten major corporations, including major fossil fuel producers, suppliers, and consumers such as BP America, Caterpillar, Alcoa, and Duke Energy, announced the formation of the United States Climate Action Partnership (USCAP).⁶ The group promised "to work with the President, the Congress, and all other stakeholders to enact an environmentally effective, economically sustainable, and fair climate change program consistent with our principles at the earliest practicable date" [61]. In a much-anticipated ruling three months later, the United States Supreme Court ruled that the EPA already had the authority to regulate greenhouse gases, raising regulatory uncertainties for business further. An additional two environmental groups and 13 firms had joined USCAP by 2008. The partnership was the primary

⁶ Caterpillar's CEO would face intense pressure from coal companies who formed a major sector of their business. Besides Duke, they were the "USCAP's most surprising charter member. The coal people couldn't understand why Caterpillar CEO Jim Owens had joined" [60: p.170]. Pooley attributes Owens support to the idea that, like Duke's Jim Rodgers, they saw USCAP's plan to support carbon capture and storage as the best long-term future for coal. Owens was a consummate inner circle member with board ties to firms Alcoa, IBM and to the Business Roundtable, Business Council, Council on Foreign Relations, and World Resources Institute.

organization developing a politics of climate capitalism in the United States and key source of the policy ideas that shaped the cap and trade legislation put forward in 2008 and 2009 [60,62].

The lead environmental group was Environmental Defense Fund (EDF), long-time advocate of business-friendly market environmentalism and the cap and trade approach.⁷ Major fossil fuel companies attracted to the group were those who already were exposed to similar legislation in the EU, such as BP and Shell. The other sectors heavily represented were the utilities and energy technology firms desiring rationalization consistent with political capitalism. With much of utilities' generation capacity reaching the end of its lifespan these firms looked for predictability for their investments and security against potential rival policy initiatives outside their influence. Finally, there was the financial services sector—Lehman Brothers was a founding member—which stood to profit handsomely from the privatization and securitization of the atmospheric commons. Firms from other sectors also had readily identifiable strategic interests [63].

Theda Skocpol [62], in the most comprehensive study to date, has analyzed the failure to pass climate legislation in 2009, despite the support of major environmental and business organizations as represented by USCAP. Employing her "polity centered approach" [64], she argues that grassroots ideological mobilization by elements on the fringe of establishment views, rather than general elite opposition, were the primary causes of the legislation's failure. This analysis was echoed by the head of the EPA under George W. Bush, Christine Todd Whitman: "It's a shame that we find ourselves in this stalemate, as business leaders have not resisted capping carbon as some might assume they would. In fact, business leaders joined with environmental leaders [to ask for] consistent federal rules on carbon emissions" [65]. Skocpol concludes: "...business people are not, right now, the prime arbiters in the Republican Party. Ideological advocates, carbon industry dead-enders, and populist anti-government forces are...including billionaire elites and grassroots activists fiercely opposed to any and all government efforts to fight global warming" [62: p.130]. However, it is useful to step back from the proximate causes of legislative failure and examine the forces involved in setting the boundaries of that policy discussion. Setting aside the question of which groups were influencing congress, little evidence is presented as to the asserted marginality of the carbon industry "dead enders" within the corporate community, other than the existence of USCAP. All this raises the question as to whether the political capitalism strategy of building "climate capitalism" documented internationally [17] was as widely accepted within the United States capitalist class as implied. Analysis of the directors of just the five pro- and five anti-climate think tanks that were most active in congressional testimony found that, between 2002 and 2007, directors more connected to the corporate community (part of the "inner circle") were significantly more affiliated with anti-climate think tanks [66]. Surprisingly, this study found direct fossil fuel ties among directors was not significantly different between the groups. Yet the literature shows not only direct but indirect social network ties of fossil fuels need to be analyzed to gauge their full political relevance. By mapping the director interlocks of the Coal Coalition, the wider EPPN, and associated organizations' climate change policy positions it is possible to examine the extent to which opposition to legislation was confined to "carbon industry dead enders" as well as how the level of integration into the wider corporate community correlates with general climate policy stance.

Skocpol also understates the importance of how capitalist hegemony and the configuration of class fractions in the wider policy planning network had confined the content of the cap and trade policy debate to varieties of political capitalism prioritizing rationalization of

⁷ EDF spearheaded the market environmentalism compromises into the 1990 Clean Air Act amendments that won over the assent of the Business Roundtable and their Clean Air Working Group [29].

investment and profits over actually limiting greenhouse gas emissions. A number of major environmental groups with a more justice-oriented approach came to oppose the USCAP framework. In fact, the National Wildlife Federation withdrew from USCAP in early 2009 after determining that the process was hopelessly compromised while other more justice-oriented groups such as Greenpeace and Friends of the Earth had been opposed to major tenets of USCAP's agenda such as free pollution permits and other loopholes from the beginning. Primary among the reasons many greens and scientists argued USCAP's approach was ineffective was its reliance on miraculous breakthroughs in carbon capture and storage technology or "clean coal" that were viewed, even by its advocates [60: p.265–8], as unlikely to occur on the timetable required for carbon reductions. Top NASA climate scientist James Hansen warned: "The dirtiest trick that governments play on their citizens is the pretense that they are working on 'clean coal' ...Cap-and-trade is the Temple of Doom. It would lock in disasters for our children and grandchildren" [67]. Defectors from the coal coalition denial bloc, like Duke and Caterpillar, saw these same government promises of investment and market incentives guaranteeing the profitability of "clean coal" (whether it was effective or not) as providing the predictability and rationalizing potential for their industries that climate change regulation threatened [60].⁸ The power structure literature would predict that those environmental groups with more ties to the corporate community and business groups would be more accepting of a such "climate capitalism" compromise. So would less carbon intensive class fractions and those facing looming uncertain investment choices like utilities or finance.

5. Data and methods

I perform exploratory analysis on a network database constructed from data on directorate interlock ties retrieved from organizational websites, tax filings, Mergent Online, and the Wharton School Corporate Library database. My sample of firms consists of publicly held Fortune 500 companies for 2009, supplemented with any of the publicly held firms among the top 20 producers among electrical utilities (megawatt hours), or top 20 producers and reserve holders for coal (tons), oil (barrels), and gas (BTUs) not already included. In addition, I included any of the firms in those energy sectors who were among the top 20 federal political contributors in the 2008 or 2006 election cycles [70]. Following Vietor, I identify members of the coal coalition, beyond the top coal producers, as publicly held firms among the top 20 utility consumers of coal, the top 10 industrial consumers, the top 20 coal reserve holders, the top 3 rail haulers, and the 5 banks with the highest investments in coal. Finally, I also included publicly available firms that were part of USCAP. The corporate sample includes 473 total firms, including 59 top energy firms, 20 coal firms and 46 firms in the coal coalition.

My energy policy planning network sample builds from the organizations identified by Crawford [4] as major policy planning groups involved in energy-related policy and extends to organizations active on climate change. I was able to obtain director lists for the NMA, Nuclear Electric Institute (NEI), and the American Coal Council that were unavailable for Crawford's study. I also add the most prominent coal industry associations identified in the literature above, as well as

⁸ Without discussing the science in any detail, Skocpol dismisses such opinions out of hand, arguing that any legislation would *a priori* be a positive step toward more effective regulation in the future [62]. Such an outcome would be a contrast with the history of coal surface mine regulation, where a compromised bill effectively demobilized social movements for national legislation and has led to continued and accelerating ecological impacts through exploitation of loopholes around MTR [68,69]. This is typical of disagreements between the class dominance and historical institutionalism approaches over the degree to which new agencies are accepted and function routinely once established [29: p.210].

additional prominent environmental organizations identified as involved in shaping climate policy. A total of 39 policy organizations are included in my EPPN sample (see Table 1).

Drawing conclusions based on public statements of policy groups can be difficult as they are sometimes contradictory and may reflect a public relations strategy or strategic goals rather than actual policy preferences: for example a group may oppose a policy ensured of passage in their favor as being too weak when they would support it if passage was questionable [29,71]. To minimize the confusion stemming from contradictory statements and actions, I applied a simplified version of the methods used by Goldman and Rogerson [72] in assessing 14 trade and policy groups' positions on climate change. Adopting their scores for the 11 organizations included in both samples, I coded 17 additional organizations into three general discourse categories of policy stance, those that reject the climate science consensus, those that accept the scientific consensus but do not support "significant" action, and those who both accept the science and support "significant" action. Using the Internet Archive Waybackmachine, I reviewed organizations' websites, official statements, press releases, and searched media coverage for statements or coverage of testimony before government bodies. Examples of statements clearly misrepresenting the scientific consensus on climate included the American Coal Council calling the IPCC reports "faulty science," and several groups, including the Chamber of Commerce's, official statements that the EPA's claim of over 90 percent certainty that anthropogenic emissions were driving warming was "not remotely support[ed]" by the scientific record. "Significant" support for climate action was operationalized as clear and substantial calls, for example, "dramatic emissions reductions," "80% emissions reduction by 2050," or explicit policy positions in favor of the EPA's endangerment finding or the pending cap and trade legislation.⁹ No groups denying the science took positions of "significant" support. Organizations without sufficient data to make a determination such as the Conference Board, or discussion groups that never take explicit policy positions like the Business Council, are treated as missing.

I construct an adjacency matrix of firms and EPPN organizations using UCINET software to describe the structure of the EPPN and the coal industry and wider coal coalition's connections to it. For my exploratory purposes here, I do not distinguish between inside and outside directors and ties are treated as non-directional/symmetrical.¹⁰ I then graph the network using Gephi software's Force Atlas2 layout that arranges network nodes in space according to similarity of ties. After comparing these exploratory findings on the networks' structure, I analyze the relationship of organizational network location to positions of policy groups on climate change action. After generating a selection of descriptive measures of network centrality via UCINET, I use the software to perform node-level difference of means tests for organizations supporting significant climate action compared to those that do not.¹¹ Finally, I apply UCINET's Johnson's hierarchical cluster

⁹ This definition of "significant" comes from the UCS and should obviously be distinguished from "sufficient" action to realistically address climate change. It also includes organizations that, for example, like the Nuclear Energy Institute, called for 80% reductions by 2050 but declined to support any specific policy proposal being considered by the government. This coding scheme is focused on rhetoric and so sets a relatively low bar but has the advantage of making for easier judgements and still providing clear distinctions within the US policy spectrum. The limitation is that it is cannot distinguish the "soft denial" of rhetoric without meaningful mechanisms [12,14].

¹⁰ Ties formed by vice presidents of EPPN organizations who are not also directors are still included, but not in the case of firms, as the data taken from Wharton only included directors.

¹¹ Because of the non-independent nature of the observations for each test 10,000 random permutations are used to create the sampling distribution of the difference between the two group means. The standard deviation of this distribution becomes the standard error for the test.

Table 1
Energy Policy Planning-Network Sample.

Organization	Status
National Petroleum Council	Advisory group to United States Dept. of Energy
American Petroleum Institute	Oil and gas trade association
Interstate Natural Gas Association of America	Natural gas pipeline industry trade organization
Independent Petroleum Association of America	Oil and gas trade association
American Gas Association	Natural gas utility trade organization
National Rural Electric Cooperative Association	Cooperative electric utility trade organization
Edison Electric Institute	Shareholder-owned electric utilities' trade organization
Nuclear Energy Institute	Nuclear energy trade organization
National Mining Association	Mining/coal trade organization
American Coal Council	Coal industry trade organization
American Coal Foundation	Coal industry trade organization
National Coal Council	Advisory group to United States Dept. of Energy
American Coalition For Clean Coal Electricity	Coal industry trade organization
Bituminous Coal Operators Association	Coal industry trade organization
Solar Energy Industries Association	Solar industry trade organization
American Wind Energy Association	Wind industry trade organization
National Association of Regulatory Utilities Commissioners	Public utility commission trade organization
National Association of Manufacturers	Ultra-conservative Policy-discussion group
US Chamber of Commerce	Ultra-conservative Policy-discussion group
The Business Council	Conservative Policy-discussion group
Business Roundtable	Conservative Policy-discussion group
Committee for Economic Development	Conservative Policy-discussion group
Conference Board	Conservative Policy-discussion group
Council on Foreign Relations	Conservative Policy-discussion group
Heritage Foundation	Ultra-conservative think-tank
American Enterprise Institute	Ultra-conservative think-tank
The Brookings Institution	Conservative think-tank
RAND Corporation	Conservative think-tank
Natural Resources Defense Council	Environmental group
Union of Concerned Scientists	Liberal think-tank
Center For American Progress	Liberal think-tank
Resources for the Future	Environmental group
Environmental Defense Fund	Environmental group
World Resources Institute	Environmental group
Alliance For Climate Protection	Environmental group
Climate Works Foundation	Environmental group
Sierra Club	Environmental group
The Nature Conservancy	Environmental group
Greenpeace	Environmental group

algorithm with weighted average differences of all pairs to create a nested partitioning of the policy group network. It joins the least different pairs successively until all nodes are a single cluster. The breakpoints in this process provide an exploratory tool to identify clustering along identifiable characteristics of groups.

6. Results

In 2009 the 20 major coal producers and reserve holders were relatively independent of major oil and other sectors that first drew the industry into the inner circle of national policy. Twelve of the major producers are independent, three are controlled by utilities, two by big oil, one by a railroad, and one by a conglomerate. However, despite this marked change from the ownership structure of the coal coalition of the late 1970s, coal firms exhibited robust interlock ties through the larger coal coalition to the EPPN.

Fig. 1 shows the coal coalition firms and the EPPN with their size indicated by their eigenvector centrality. Firms are represented by squares and the primary role within the coalition is indicated by color. The EPPN organizations are represented by circles and are color coded according to their position toward climate change and climate policy with red representing hostility to science and policy, yellow indicating acceptance of climate science but lack of policy support, green representing significant science and policy support, and white missing data. Lines connecting the nodes represent ties formed by director interlocks; thicker lines indicate multiple shared directors. Lines are shaded in color blending those of the two connected nodes.

Unsurprisingly, the ultraconservative groups are all hostile to climate science and policy as are the major fossil fuel organizations with the exception of the gas industry. Gas industry trade associations are joined by the Business Roundtable in taking an intermediate position of accepting the science but not significant action.

Every major coal producing or reserve holding firm is tied to policy groups in the EPPN except the smallest, James River Coal Company, which is connected by other members of the coal coalition to the network. Coal firms outside of the bottom right corner are firms who, despite being a top producer or reserve owner, have their primary business in other sectors. No coal coalition firms are isolates but several EPPN policy groups are including the left-leaning Greenpeace and liberal Sierra Club, the ultraconservative Heritage Foundation, the Solar Energy Industries Association, the National Association of Regulatory Utilities, and the National Rural Electric Cooperative Association.

The network exhibits a clear polarity between policy groups with ties to coal firms and those with ties to environmental organizations. Exceptional cases to the trend of support decreasing from right to left are the EEI and NEI trade associations that appear closer to the coal/ultraconservative side yet supported climate action. Think-tank polarity also falls along predictable lines with environmental organizations at one pole linked to moderate-conservatives in the center and ultra-conservative policy organizations and the coal industry on the other pole. The liberal think-tank Center for American Progress, which had prominent ties to the Obama administration, is marginal, connected to the network through a solitary tie via coal coalition firm Union Pacific. Utilities occupy an intermediate position between the main policy

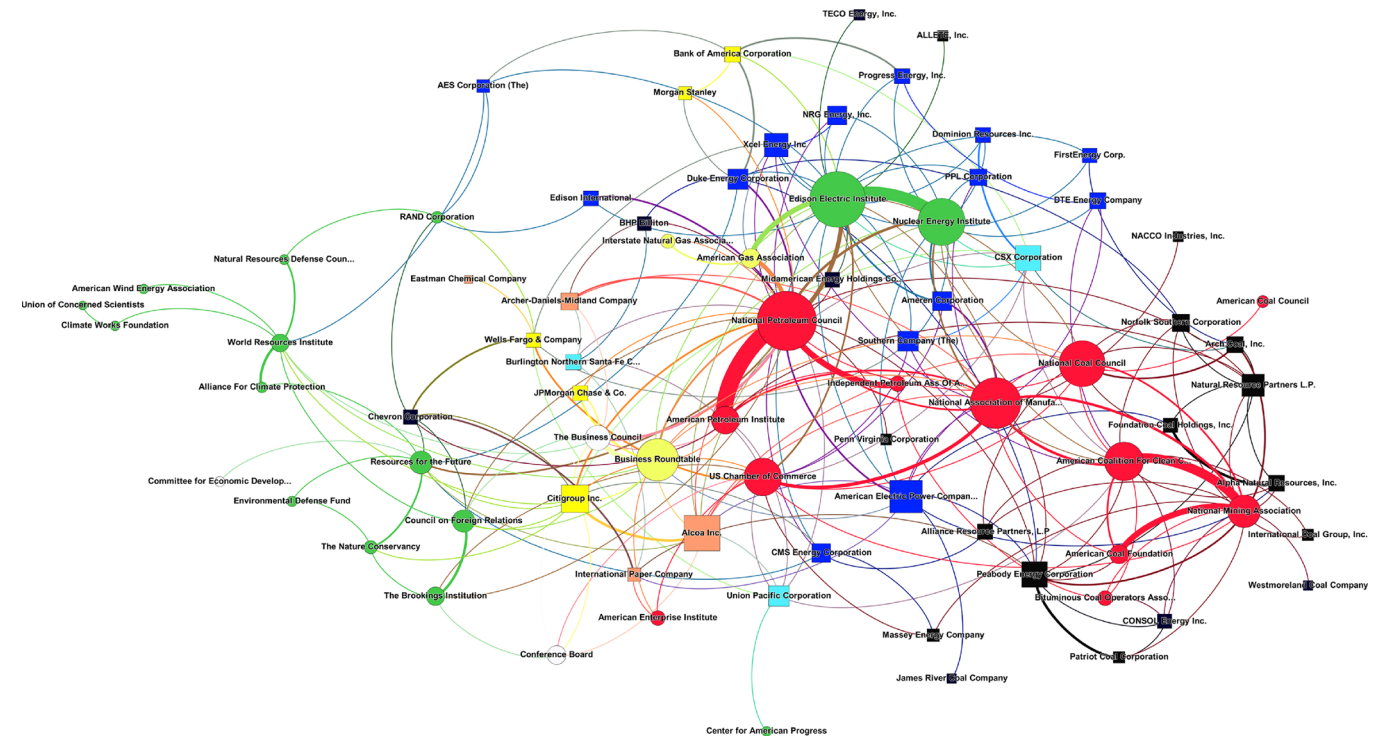


Fig. 1. Coal coalition and EPPN. Black indicates top coal producers and reserve owners (this coding takes precedence over others where there is overlap). Dark blue indicates top coal burning utilities. Orange indicates top industrial consumers of coal. Light blue indicates top coal hauling railroads. Gold indicates top coal financing banks. The thickness of lines between nodes reflects the number of director interlocks. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article).

groups and the coal firms. Other than the extractive-oriented International Paper Company, the industrial coal consumers occupy a more central position as do the railroads that are not also major coal producers/owners. Consistent with theories of monopoly-finance capital as the dominant class fraction today [73], Citigroup, JPMorgan Chase, and Wells Fargo are located near the moderate-conservative spatial center of the policy spectrum. Bank of America and Morgan Stanley are coupled with the major coal-burning utilities and energy industry associations.

Fig. 2 shows just the EPPN for clarity, sized, colored, and linked as described above. Here the polarity of the network between organizations supporting climate action and those that do not, or are even hostile to climate science, stands out more clearly. The NEI and EEI are highlighted as exceptions to this pattern both in their location on the right side of the network and in their greater overall centrality within the network as represented by their size. The comparative marginality within the network of renewables is also visible by the absence of any link for the main solar industry association and the Wind Energy

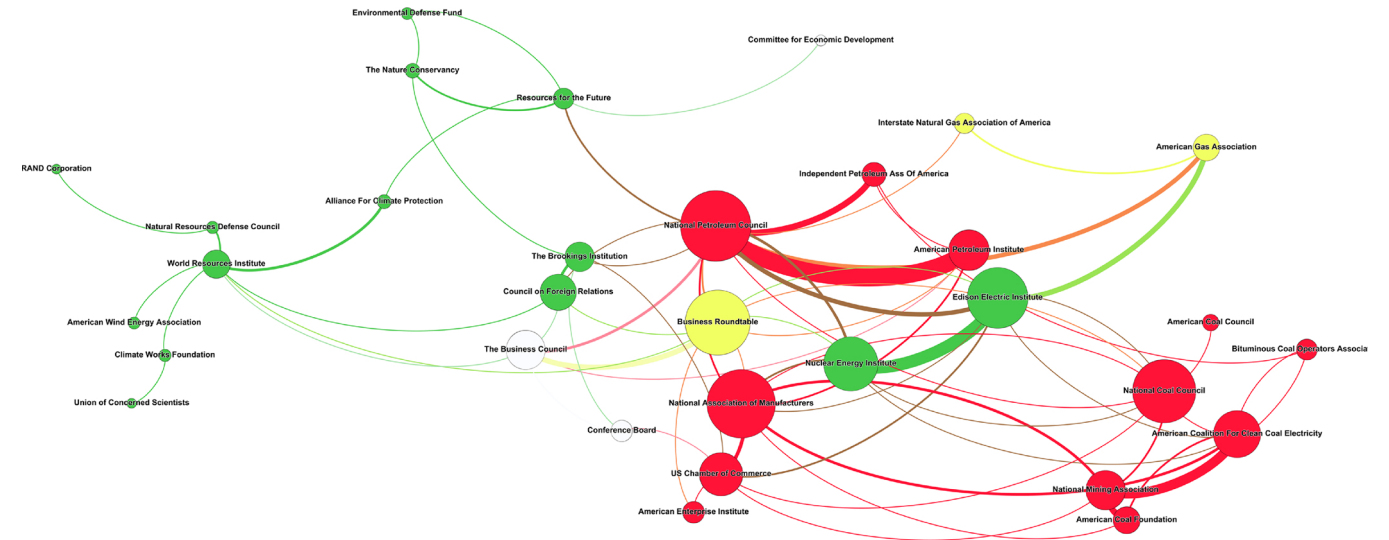


Fig. 2. EPPN. Green indicates support for climate science and significant action. Yellow indicates acceptance of science but not action. Red represents the rejection of science and action. White indicates no position or missing data. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article).

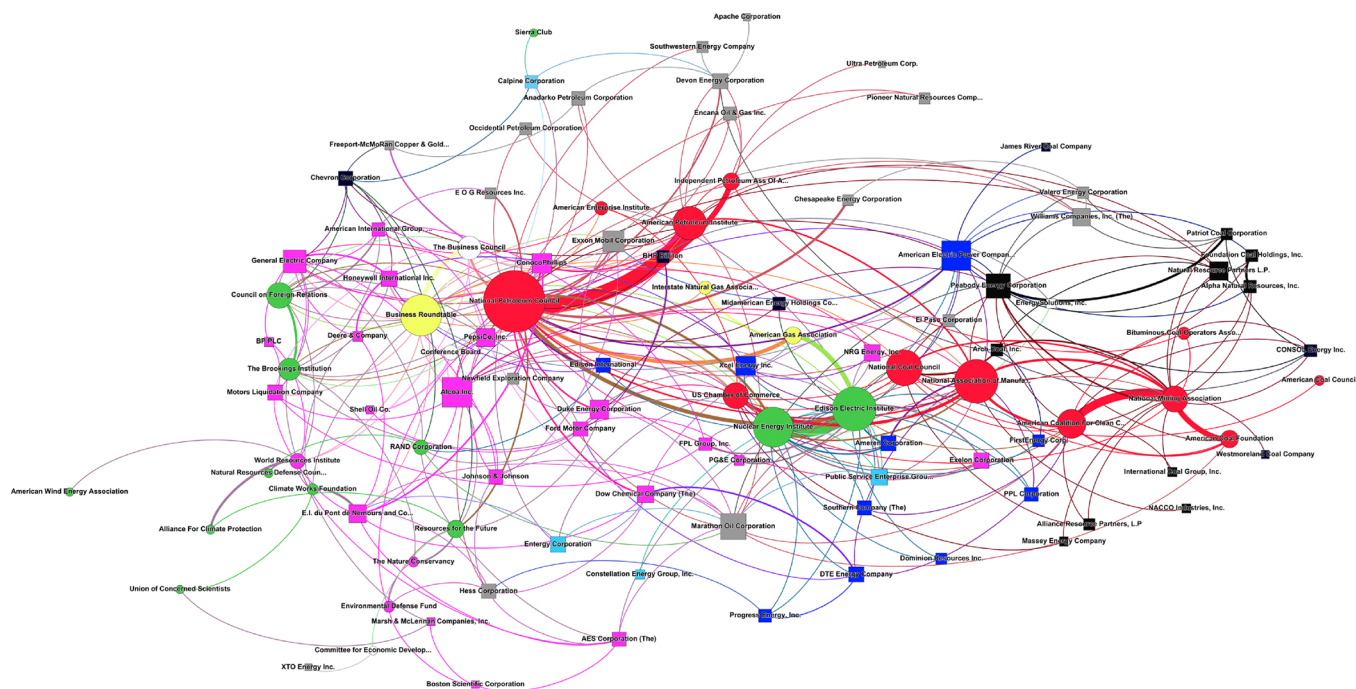


Fig. 3. EPPN, USCAP, & Top Energy Firms. Black indicates top coal firms. Grey indicates oil and gas firms. Dark blue indicates top coal burning utilities. Light blue indicates top utilities that are not also top coal consumers. Magenta indicates USCAP organizations. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article).

Association's solitary tie to the World Resources Institute as its only source of indirect linkages to the moderate-conservative general policy organizations. Coal associations, in contrast have multiple direct linkages with the ultra-conservative general policy groups and one with the moderate Business Roundtable. Oil, as discussed further below, is the most centrally connected within the network, consistent with past findings that the National Petroleum Council and American Petroleum Institute are dominant institutions in energy policy.

Fig. 3 shows the EPPN, coded for policy position as above, with ties to the top energy firms (sampled as in [4]) and USCAP firms, all with sizes based on eigenvector centrality. This network also has no isolated firms, and here a board tie with the utility Calpine Corporation connects Sierra Club to the network. Greenpeace and the Heritage Foundation remain isolates. The same rough spectrum from Fig. 1 shows itself here with oil and gas in a relatively more central distribution than coal and USCAP firms more toward the liberal/environmental end. While all included firms from the coal coalition and associated industry groups are connected via interlocks with the network, they are much more confined to the ultra-conservative end of the network relative to other fossil fuels. Overall, these figures suggest most clearly that while some oil, gas, and coal coalition members (i.e. Duke Power) have ties with USCAP's political capitalism project (a "climate capitalism" rationalization of uncertainties) nearly all the largest coal producers and reserve holders remain tightly linked with the the ultra-conservative denial camp, the exceptions being those for which coal is not their primary business. Furthermore, many of those fossil fuel-connected USCAP organizations also retained ties to other denial-oriented industry associations and policy groups.

One way to parse the complex features of the network is to ask whether policy groups supporting climate action are more connected, or central, within the network overall. Table 2 displays the centrality scores of the organizations within Fig. 3 (EPPN, top energy firms and USCAP) using a variety of measures that operationalize the concept differently [74]. The results are consistent with expectations of industry associations and policy groups being the most central nodes in the network, connecting the firms across sectors. Also of note, despite their

forming the right pole of the network as described in the graph theoretic layout, the relative centrality scores of the major coal industry associations and firms put them on a comparable basis with other sectors.

T-tests across a variety of measures indicate the average centrality of organizations supporting climate action (coded as 1 in Table 2) are lower than those who do not (coded as 0 and -1). Degree-based measures of centrality are similar to the conception of social capital. "Degree" is simply a measure of the total number of direct ties an organization has. But the literature suggests indirect ties are also potentially important politically, therefore measuring centrality by the number of nodes within "2 steps" (i.e. "friend of a friend") captures this. A t-test using his measure shows a significant difference of means of 20 ($p = .049$ two-tailed). Bonacich's influence or "power" centrality measure considers not only the direct ties of a node but weights centrality based on the degree of ties of its connected neighbors [75]. In this analysis the measure means organizations with interlocks to other highly interlocked organizations receive higher scores than organizations with a similar number of interlocks (degree) but to less well-connected organizations. With this measure, again, I find those supporting climate action less central within the network (diff of means = 1267 $p = .051$ two-tailed). Another measure/conceptualization of centrality is "closeness" which can be measured by Freeman's measure of the sum of the lengths of the shortest path from a node to all others in the network component (geodesics). Here Freeman's closeness equals the number of ties required to reach every other organization from a given organization, so a lower score reflects more direct connections and higher centrality (i.e. being less distant from the rest of the network). Freeman's measure also shows climate action supporters as significantly less central (diff of means = 45, $p = .028$ two-tailed). These results across several ways of conceptualizing centrality are consistent with an interpretation that the "center of gravity" of the EPPN's policy groups is tilted away from, rather than toward, climate action. However, this result must be interpreted in the context of the sampling frame of the largest energy firms and major policy organizations and industry associations identified the literature, in both of

Table 2
Organization Climate Stance and Centrality Scores.^a

	Climate Stance	Degree	BonPwr	2Step	Freeman's closeness
National Petroleum Council	–1	44	7004.51	95	299
Edison Electric Institute	1	27	4817.41	84	329
National Association of Manufacturers	–1	20	4775.02	85	335
Business Roundtable	0	18	4349.68	87	334
Nuclear Energy Institute	1	22	4299.57	83	335
National Coal Council	–1	15	3727.77	83	342
Alcoa Inc.*		14	3599.00	88	336
American Electric Power Company, Inc.		14	3531.34	79	347
American Petroleum Institute	–1	17	3302.78	77	345
Marathon Oil Corporation		15	2958.29	77	347
American Coalition For Clean Coal Electricity	–1	15	2775.27	57	379
Peabody Energy Corporation		13	2725.35	70	359
General Electric Company*		14	2373.25	65	362
National Mining Association	–1	17	2370.27	50	381
US Chamber of Commerce	–1	13	2366.75	69	360
Council on Foreign Relations	1	12	2246.84	71	358
Exxon Mobil Corporation		9	2240.70	59	375
Xcel Energy Inc.		7	2091.32	66	369
The Business Council	NA	9	1995.36	64	368
ConocoPhillips*		9	1971.53	64	368
Duke Energy Corporation*		8	1895.75	72	360
Natural Resource Partners L.P.		8	1825.94	62	374
PepsiCo, Inc.*		8	1757.23	59	375
The Brookings Institution	1	11	1749.83	73	355
Williams Companies, Inc. (The)		7	1702.08	55	382
E.I. du Pont de Nemours and Company*		11	1692.76	47	384
Dow Chemical Company (The)*		8	1528.61	63	368
NRG Energy, Inc.*		4	1525.08	61	378
Public Service Enterprise Group Incorporated		5	1476.62	43	404
Ameren Corporation		4	1361.88	41	408
Exelon Corporation*		3	1349.42	60	380
Honeywell International Inc.*		8	1311.61	39	399
American Coal Foundation	–1	5	1308.22	40	409
DTE Energy Company		6	1305.55	46	398
Entergy Corporation		5	1303.77	63	372
Motors Liquidation Company*		7	1289.04	36	404
Devon Energy Corporation		8	1259.69	54	381
Resources for the Future	1	8	1226.76	61	372
American Gas Association	0	4	1223.55	58	382
Ford Motor Company*		9	1210.31	50	385
Southern Company (The)		4	1194.87	44	406
Johnson & Johnson*		6	1182.73	41	397
Edison International		4	1171.58	63	375
Independent Petroleum Ass. of America		7	1168.98	52	385
PPL Corporation		3	1163.22	36	417
Hess Corporation		7	1161.20	57	379
Chevron Corporation		9	1137.11	46	397
AES Corporation (The)*		7	1053.49	55	382
Anadarko Petroleum Corporation		4	998.94	48	395
Midamerican Energy Holdings Company		2	989.33	57	385
American International Group, Inc.*		8	981.69	34	413
Progress Energy, Inc.		4	971.44	35	415
Encana Oil & Gas Inc.		3	961.47	47	397
FPL Group, Inc.*		4	955.07	42	404
Alpha Natural Resources, Inc.		5	952.51	31	423
World Resources Institute*	1	9	916.96	38	401
Conference Board	NA	6	904.77	39	395
BHP Billiton		4	884.73	51	389
Calpine Corporation		5	871.90	55	384
Occidental Petroleum Corporation		2	862.84	45	400
RAND Corporation		7	846.63	42	396
Foundation Coal Holdings, Inc.		4	842.31	22	434
Arch Coal, Inc.		5	841.71	33	417
CONSOL Energy Inc.		6	838.34	29	428
FirstEnergy Corp.		3	834.72	34	419
El Paso Corporation		3	785.68	51	390
Valero Energy Corporation		5	783.33	24	430
American Enterprise Institute	–1	4	770.25	34	408
Dominion Resources Inc.		2	763.42	30	427
Newfield Exploration Company		2	745.32	44	401
Alliance Resource Partners, L.P		3	744.07	27	430
Patriot Coal Corporation		5	708.16	26	438
Southwestern Energy Company		2	692.20	46	399
Interstate Natural Gas Association of America	0	2	689.18	44	401

(continued on next page)

Table 2 (continued)

	Climate Stance	Degree	BonPwr	2Step	Freeman's closeness
Pioneer Natural Resources Company		2	684.63	46	399
E O G Resources Inc.		2	668.99	48	397
Chesapeake Energy Corporation		2	652.42	46	399
Bituminous Coal Operators Association	−1	4	601.39	29	429
PG&E Corporation*		2	505.42	34	418
Deere & Company*		4	489.27	26	437
EnergySolutions, Inc.		2	434.98	24	435
Climate Works Foundation	1	5	432.81	26	436
International Coal Group, Inc.		2	431.74	21	468
Constellation Energy Group, Inc.		1	403.34	27	432
NACCO Industries, Inc.		1	399.80	20	438
Massey Energy Company		2	397.62	26	442
Environmental Defense Fund*	1	5	386.35	22	446
BP PLC*		3	385.45	24	449
Freeport-McMoRan Copper & Gold Inc.		3	346.05	17	452
American Coal Council	−1	1	312.33	15	445
James River Coal Company		1	295.93	14	450
The Nature Conservancy*	1	3	283.86	21	440
Westmoreland Coal Company		1	198.96	17	484
Alliance For Climate Protection	1	2	181.04	17	455
Shell Oil Co.*		2	178.65	13	470
Marsh & McLennan Companies, Inc.*		3	164.92	16	450
Natural Resources Defense Council	1	2	149.29	15	474
Boston Scientific Corporation*		3	137.02	14	463
Apache Corporation		1	106.21	8	484
Committee for Economic Development	NA	2	105.27	9	473
Ultra Petroleum Corp.		1	98.63	7	488
American Wind Energy Association	1	1	77.58	9	504
Sierra Club	1	1	73.82	5	487
Union of Concerned Scientists	1	2	51.92	8	523
XTO Energy Inc.		1	9.79	2	576

^a * designates organization as part of USCAP.

which fossil fuels are predominant. But to the degree this sample is representative of the important players in that network the findings are relevant.

Fig. 4 illustrates Johnson's hierarchical cluster analysis using weighted average differences of all pairs. The analysis indicates the environmental and “liberal” end of the moderate-conservative wing such as RAND and the Committee for Economic Development are

groupings less similar to the rest of the network containing most of the core business policy organizations, fossil fuel, and utility associations. At the next hierarchical level the two main gas industry associations are distinct. Below that, ultraconservative trade organizations NAM and the Chamber of Commerce form a cluster with coal, nuclear and utility associations. This is an interesting combination of the ultra-conservatives with associations linked by electrical generation. That cluster

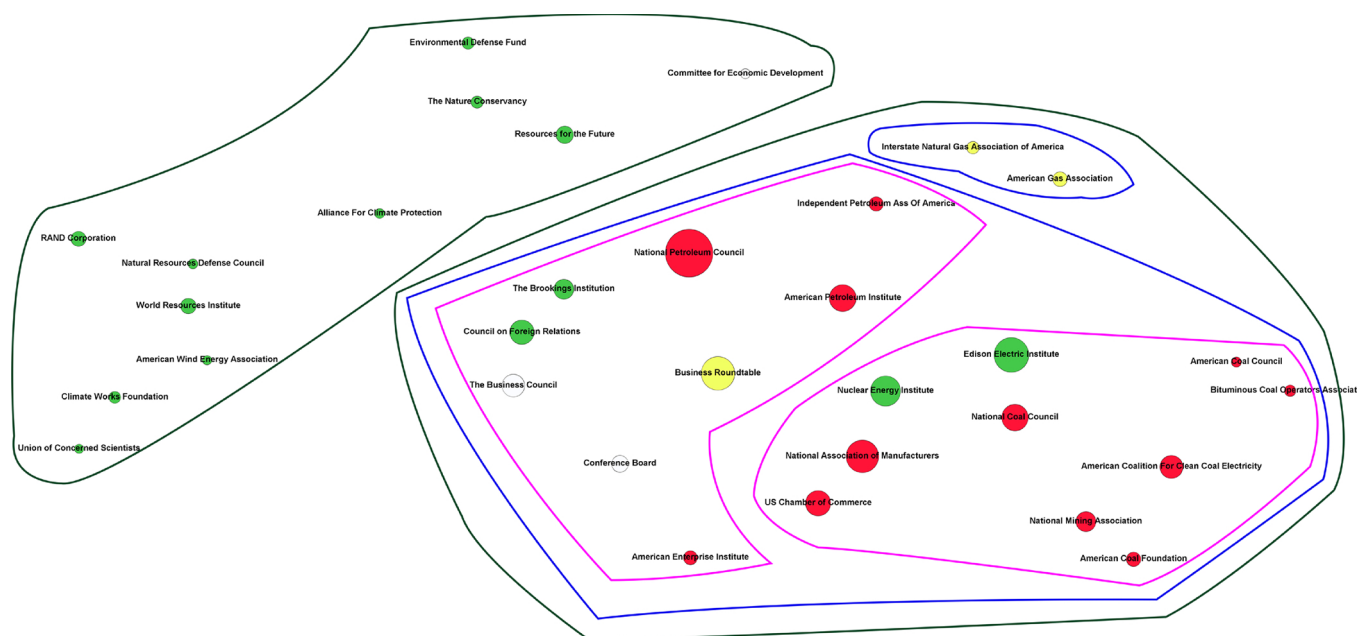


Fig. 4. Cluster Analysis Results. Shading indicates hierarchical clustering levels.

is distinguished from one composed of the most powerful, inner-circle dominated, moderate-conservative organizations such as the Business Roundtable and Business Council, oil industry affiliated organizations who have historically dominated energy policy, and AEI (which had moved closer to the center of the PPN after the right-turn of the 1980s [47]).

7. Discussion

EPPN organizations missing from earlier studies [4]—The Business Roundtable, NEI, and NMA—are clearly important nodes in the overall network with higher than average ties, and so their inclusion gives a better understanding of the overall structure of the network and coal's place within it. A key finding is that none of the top energy firms are isolates within the networks described and with the exception of a few policy group isolates the network consists of a single large component. Coal's increased autonomy from the ownership structure of previous decades created both the potential opportunity of pursuing a more independent agenda and, alternatively, of a return to marginality within the national power elite as experienced pre-1960s. However, it is clear that coal's director ties among the top companies remained robust and kept it connected to the larger EPPN.

It is difficult to distinguish between the role of network ties, general ideological positions, the economy's structural dependence on coal as cheap energy for economic growth, or other factors in swaying the broad-based multi-issue policy organizations such as the Business Roundtable for or against climate action. While it is perhaps not surprising that ultra-conservative organizations like the Chamber of Commerce who have been long identified with the climate change-counter movement were in the denial camp, visual analysis of the graphs and the results of my cluster analysis indicate differences between coal and other fossil fuels' alignments with moderate and ultra-conservative ends of the policy-discussion spectrum.

Of the fossil fuel-related industries that would be potentially negatively impacted by climate regulation only the EEI had a favorable position on climate action. The Business Roundtable, though accepting the science, did not support legislative action and no environmental legislation has passed over its opposition since 1975 [29]. The weaker centrality within the EPPN of organizations supportive of climate action, their clustering apart from the core of the general business PPN organizations, and the unsupportive stance of the Business Roundtable undermines the notion that there is the kind of consensus within the corporate community implied by Skocpol or Whitman and instead compliments Hein and Jenkins findings of greater "inner circle" opposition [66]. However, there are also clear capitalist divisions over climate stance within the network. The moderate versus ultra-conservative poles of the network are one such divide but there is also a more complex pattern within fossil fuels. While coal is overwhelmingly linked with institutions hostile to climate science, members of the coal coalition, oil and gas, sometimes have more nuanced ties. All fossil fuel trade associations are in the climate denial camp, but some major oil and gas firms and coal consuming utilities have joined with nuclear and corporate dominated environmental groups to pursue a political capitalism response to the business and legitimacy threats of climate change. This suggests that while Hein and Jenkins found board ties to fossil fuels were not significant in their model, there are potentially important fractional differences between sectors of the fossil fuel industry on climate change.

Only two of the ten most central organizations were climate action supporters. Because nuclear is a low carbon energy source, the NEI had clear economic interests in proposed climate legislation and, like EEI's embrace of action, NEI's support came alongside highly favorable discourse for providing (additional) massive government subsidies and loan guarantees in a context of the need for rationalization of investment after a long period of stagnation and aging infrastructure needing replacement in their sector [20]. Anomalous, cluster analysis places

these two with the block of ultra-conservative organizations and coal associations committed to climate denial. EEI is the most anomalous case in terms of its interlock ties and climate position given its significant links to coal dependent utilities and four of the largest coal producers/reserve owners; although, this is qualified by its dense ties with the NEI as well. One key actor, Jim Rogers, tied major coal and nuclear utility Duke Energy to both EEI, which was helping to craft climate policy, and the National Petroleum Council and ACCCE which were out to derail it. Rogers was a key player protecting coal in the climate policy negotiations inside USCAP, and he had a leadership role in EEI's embrace of climate action [60]—a major break from the organization's decades opposition [76]. He was considered a visionary by groups like EDF, a conman by groups like Greenpeace, and a traitor by much of the coal industry [60]. Regardless of his sincerity in the process (he eventually withdrew Duke Energy from ACCCE, but remained in the Chamber of Commerce), Rogers is a prime case study of the role that director interlocks can play in shaping policy within the network and the mediating role of coal coalition interests. Duke was not the only major coal interest in USCAP, utilities AES and NRG Energy were there as well as the highly central top coal consumer, Alcoa. Similar to Sapinski's [16] counter-intuitive findings in the global policy network shaping the "climate capitalism" project, renewable energy industry association presence is minor within the network compared with those focused on fossil fuels, likely due to renewables firms smaller size and resources for participation compared with the fossil fuel oligopolies.

In return for EEI's support in the process, the 2009 legislation, as framed by USCAP, proposed support for coal lavish enough to allow coal-supporter and Virginia Congressman Rick Boucher to point to the EPA's analysis that it would *increase* coal usage and usher in a "golden age" of coal use [60,77]. BP's CEO Tony Hayward, shortly before his company joined others in abandoning USCAP, complained to Rogers that the climate legislation was too favorable to coal: "you guys got everything you wanted and we got nothing," to which Rogers' attributed Duke's "head start" in the policy formation process [60: p.437].

The power structure literature predicts that as major environmental groups are effectively dominated by the capitalist class via funding and board memberships, their policy proposals will seek to reconcile scientific discourses with capitalist class interests through market-based policies like cap and trade [29,30]. In explaining EDF and NRDC's protracted involvement in what he considered a hopelessly compromised USCAP framework, Michael Dorsey, a Sierra Club board member, concludes they were "well-meaning liberals who do not pay enough attention to political economy...They got outmaneuvered, they got hoodwinked, because they were in over their head" [quoted in 60: p.379]. My analysis suggests a complimentary broader structural explanation: "well-meaning liberals" in leadership at major environmental organizations who are integrated into the corporate community succumb to the power of what Wright and Nyberg describe in their analysis of the Australian corporate community as "political myths" of corporate environmentalism, citizenship, and omnipotence. They become collaborators in a political economy of "creative self-destruction" spinning out profitable but ineffective schemes to address climate change [10]. It would be a mistake, in particular, to underestimate EDF's commitment to the ideology shared by the moderate-conservative wing of the EPPN [30,60]. EDF had 11 interlocks with capitalist firms in 2009, the Nature Conservancy eight, Resources for the Future four, and NRDC two. Even Sierra Club, which gave lukewarm support for the USCAP process at first before opposing the final product, had an interlock connecting them indirectly with the EPPN. Sierra Club's marginal connection to the corporate community mirrors their behavior of hovering "on the edge of supporting the USCAP effort" before rejecting it in 2010 [62: p.101]. Greenpeace (while having a prominent environmental sociologist on their board) had no corporate interlocks in my sample and were opposed to the route taken by USCAP from the beginning.

8. Conclusion

This article has mapped director interlocks as one pathway through which different capitalist class fractions have the capacity to draw on the expertise of professional staff, debate, and formulate policy positions. While other pathways of influence such as funding and media communications are undoubtedly important as well, interlocks are one measure of the capacities of particular class fractions to have their say within the state policy formation process. Industry associations help to coordinate interests on a sectoral basis and general business and policy-discussion groups form linkages across multiple sectors. Nearly all the major firms and policy organization identified in my samples are linked via their boards into a single network component indicating the capacity for wide-reaching energy policy discussion. The coal industry in 2009 remained well connected, and potentially influential, within the EPPN though not as central as the oil industry. Further analysis is needed to trace the history of the coal coalition relative to other energy sectors' allied interests through the 1980s and '90s and to examine more systematically the role of government advisory groups and appointments that are also part of the policy-planning network.

The analysis of the EPPN policy stances shows a significant divide over rhetoric on climate change. It would be premature to infer widespread support among big business leadership based on the actions of USCAP as Whitman does or to write off the fossil fuel industry as marginal "dead enders." Fossil fuels industry associations and government advisory councils, consistent with past studies, are highly central within the network. However, there appears to be a divide between the coal industry and other fossil fuels in their clustering with key policy discussion groups. Coal's position as a more solidly domestic industry than oil and gas may account for some of their affinity for ultra-conservative policy groups, but it is unclear what role of ideological similarity versus instrumental concerns about climate denial played in this pattern.

Skocpol compares the "insider bargain" strategy of USCAP unfavorably to the more successful and movement mobilization-oriented Health Care for America Now (HCAN) effort to pass healthcare legislation during the same period. But a power structure approach, viewing these policymaking processes through the lens of political capitalism, reveals meaningful differences. Although both bills were fundamentally based on proposals from the capitalist policy planning network, EDF most prominently in the cap and trade case and the Heritage Foundation in the case of mandated private insurance [78], my findings suggest that their central premises were received much differently by most central policy planning organizations and relevant trade associations. The aloof center, characterized by the Business Roundtable, and hardcore opposition of the majority of fossil fuel industry groups in the EPPN is in stark contrast to Skocpol's [62] comparison case of healthcare reform occurring around the same time. In the latter, not only was there strong support from central organizations like the Business Roundtable, which endorsed the core policy instrument of the Affordable Care Act, but also from *most of the healthcare industry associations* [78].

A limitation of my analysis is that it does not analyze what effect, if any, the policy stance of EPPN organizations had on the failure of climate legislation in congress. Policy groups seek to set the terms of the debate not only via direct influence on lawmakers and regulators but through influencing public opinion. Local economic considerations as described by Fisher [22], and public opinion as shaped by the broader knowledge production process may both bear directly on state officials, independent of the national policy-planning network. However, the polity approach has neglected these contrasting positions of the most central business policy group and affected industry associations as unimportant for a case study comparison [62]. Indeed, the Business Roundtable's positions are unworthy even of mention. Skocpol's focus on mobilization of the masses and public opinion for influencing legislators on climate legislation, while important, runs the risk of pluralist

approaches to miss the way in which the terms of the debate are determined outside of congress [29].

My findings raise the need for attention to how the structure of energy systems creates interests beyond energy companies themselves. Coal coalition organizations' more diverse connections provided the capacity for that class fraction to employ a co-optation rather than good-faith collaboration strategy. Skocpol recognizes corporations involved in crafting climate policy with USCAP:

... could double their bottom-line bets – [working] to hammer out draft climate legislation that was as favorable as possible to their industry or their firms, and at the same time participating in business associations likely to lobby against much or all of the terms of that insider bargain once it faced Congress or the general public. As they should do given their role as heads of profit-maximizing businesses... [62: p.48]

Former Businessweek editor (and future EDF board member) Eric Pooley [60: p.385-6] summarizes the "climate capitalism" sensibilities of the liberal wing of the EPPN regarding the need for accepting inequities and ineffectiveness in organizing a power bloc that could push forward a political capitalism agenda on climate:

Unless powerful people and institutions stood to profit from global warming solutions, global warming wasn't going to be solved... Without lobbyists from Goldman and Credit Suisse and USCAP pushing hard for a climate bill...coal and oil industries would never be defeated.

However, as enticing as fees and derivatives markets for carbon may be to major financial institutions, these must be weighed against the threat posed to them by the popping of the "carbon bubble" consisting of assets in the global economy, such as the fossil fuel reserves of major extractive firms, whose valorization is premised on continued emissions. The rents and speculative gains offered by cap and trade would need to be formidable indeed if these assets were in fact to be rendered mostly valueless, as climate action requires.¹² Beyond the carbon bubble, of course, is the strong interest of finance, like capital in general, in overall growth rates potentially threatened by meaningful carbon limits. This growth conflict does not apply to policies bolstering investments in renewables as new renewable energy capacity has been shown to have little displacement impact on fossil fuel use, rather the added energy supply is swallowed up by economic growth [79: p.221-22]. Despite offering some suggestive examples around EEI, my network analysis cannot show that the other largest coal interests in finance or the utility sector were motivated by or acted on those interests through their connections to influence policy stances. Future research that draws upon qualitative reports of director interactions to identify specific processes by which influence is exercised and statistical analysis of how ties between sectors or class fractions may predict policy stance is needed.

An important question is whether climate change rises above the special interest process to become a genuine class issue for policy formation on which the most powerful moderate organizations bring their weight to bear. Mizruchi [80], for one, suggests that only a unified corporate elite could overcome public opposition and partisan rancor for action on climate change and notes hopefully the formation of USCAP. But they key question for climate capitalism is reconciling the science of climate change with the imperative of unlimited growth. Past studies indicate that when the most powerful moderate conservative groups like the Business Roundtable accept an environmental policy it can succeed over the objections of the ultra-conservatives. How these most influential moderate institutions come to see the implications of a

¹² Between 2005 and 2011 Goldman and Credit Suisse invested 8.6 billion and 12.1 billion dollars respectively in the coal industry; making them the 11th and 9th largest investors in the sector globally.

given climate policy for economic growth, whether it will rationalize investment and smooth it or potentially limit it would seem to be the decisive criteria. Where the coal coalition was able to win over Business Roundtable support in the past on the issue of growth—as in the case of Clean Air Act Amendments in the late 1970s—it had its greatest impact [55]. Restricting air pollution from coal plants through the proposed policies was seen as a class-wide threat to accumulation. In other cases, like surface mining regulation of the same period, where general class interests were not perceived and moderate-conservative support was not forthcoming, the industry's ability to shape legislation was far more limited, which left them to try to make up for defeats in Congress through the regulatory process [45,55].¹³ We might view the efforts of USCAP as a failed attempt to organize a power bloc of class fractions to establish a new dominant, if not hegemonic, “climate capitalism” class response as seen in other nations, in place of the blatant denial that they viewed as precarious in terms of legitimacy and long-term stability.

If, utilizing class leverage, energy corporations with dense network ties to the central business organizations in a country dominate policy discussions on energy development, impair assessments of changing energy needs, promote denial of environmental problems associated with the dominant energy industries, and limit solutions for addressing concerns around climate change and environmental contamination, then comparison also may help develop lessons of resistance useful for global social movements. This case study can form the basis of future research to examine cross-nationally how energy-industry networks are embedded within larger corporate elite and government associations, even overlapping with environmental movement organizations in predictable patterns. Promising comparisons would include states with historically powerful coal interests such as Australia [6,81], that nevertheless made temporary steps toward taxing carbon, or Canada's oil dominated energy policy-planning network and its hegemonic stance of “soft denial” [14]. Alternatively cases like Japan with marginal fossil fuel interests but a powerful nuclear energy industry [82,83] indicate greater consensus on climate but greater constraint on environmental groups criticism of nuclear risks. Energy transition successes in nations with more diverse energy industries like the German *Energiewende* are yet another possibility for tracing the role of shifting elite policy networks [84]. Such comparisons could help explain interactions between degrees of overall class dominance and how specific energy sectors utilize their political capacities to act on the state apparatus and public opinion to secure long-term energy development agendas.

Acknowledgements

This research was supported by a dissertation fellowship from the Wayne Morse Center for Law and Politics. I would also like to thank Val Burris, John Bellamy Foster, Michael Dreiling, Cade Jameson, Chris Hardnack, Sabrina Danielsen, Kevin Estep, Liz Veazey, and the anonymous reviewers for their helpful discussion, comments, and suggestions at various stages of the manuscript.

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¹³ Despite later successful exploitation of loopholes around mountaintop removal mining, this was a significant legislative defeat for coal in the *special interest process*: “there is nothing...that indicates the [Surface Mining Regulation and Control] act was a consequence of efforts by enlightened corporate liberals to dampen competition or to control markets. It might even be said that are no enlightened corporate liberals in the coal industry” [45: p.125].

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